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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/741,332 | 12/21/2000 | Kinya Kato | 35.C14996 | 6155 |

5514 7590 10/21/2003

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| EXAMINER |
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WONG, EDNA

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| ART UNIT | PAPER NUMBER |
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1753

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/741,332

Applicant(s)

KATO ET AL.

Examiner

Edna Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-26, 28-39, 56-60, 63-65 and 67-85 is/are pending in the application.
- 4a) Of the above claim(s) 82-85 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-26, 28-39, 56-60, 63-65 and 67-81 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 19. 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 1, 2003 has been entered.

Election/Restrictions

Newly submitted claims **82-85** (now entered per RCE request) are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claim 82 recites:

An apparatus for purifying polluted soil which contains a pollutant, comprising:

a heater to heat the polluted soil to make the soil emit a pollutant;

a mixing means having a space to mix the gas containing the pollutant and chlorine; and

a light irradiating means to irradiate the mixture with light to decompose the pollutant.

The apparatus comprises a heater, a mixing means having a space and a light

irradiating means. The apparatus of claim 82 differs from the originally claimed apparatus in that the apparatus of claim 82 does not structurally comprise a chlorine-containing gas generating means.

Furthermore, the past 4 Office Actions were directed to an apparatus requiring a chlorine-containing gas generating means, and the apparatus of claim 82, without such means, is not the same type of apparatus originally claimed and would not be capable of carrying out the methods as presently claimed which require chlorine gas.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 82-85 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Double Patenting

Claims **2-26, 28-39, 56-60, 63-65 and 67-81** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims **1-49** of U.S. Patent No. 6,538,170 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because the referenced patent and the present application are claiming common subject matter, as follows:

(a) mixing a gas containing a pollutant extracted or emitted from soil and a chlorine-containing gas to form a gaseous mixture;

- (b) irradiating the gaseous mixture with light to decompose the pollutant; and
- (c) producing functional water by electrolysis.

The independent claims of the present application recites similar limitations, either alone or in combination with their dependent claims, as that of the claims of the patent wherein the claims of the present application (narrow) are encompassed by the claims of the patent (broad). Therefore, the claims would have been obvious variants over each other.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Method

I. Claims **67-68 and 74-79** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Calcote et al.** (US Patent No. 5,813,799) in combination with **Robson** (US Patent No. 5,308,507).

Calcote teaches a method for purifying polluted soil which contains a pollutant, comprising the step of:

heating **10, 12** polluted soil to emit a gas containing a pollutant **32** (col. 3, lines 20-44; and Fig. 1).

The heating is conducted using a heater **12** (col. 3, lines 20-44; and Fig. 1).

The pollutant is adsorbed on an adsorption material **38** (= charcoal filter) [col. 3, lines 40-44].

Calcote does not teach obtaining a mixture of the gas containing a pollutant and chlorine; and irradiating the mixture with light to decompose the pollutant.

However, Robson teaches a method for purifying polluted soil (col. 4, line 64 to col. 5, line 5) which contains a pollutant, comprising:

(a) obtaining a mixture **56** containing a pollutant (= from waste stream) and chlorine (= from chlorine containing oxidants) [col. 3, lines 19-61; and Fig. 4]; and

(b) irradiating the mixture with light to decompose the pollutant (col. 3, lines 62-68).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the method of Calcote by obtaining a mixture of the gas containing a pollutant and chlorine; and irradiating the gaseous mixture with light to decompose the pollutant because Calcote teaches drawing the contaminant vapors **32** released by heating the aquifer and soil rise by a fan or vacuum pump **36** to a vapor condenser or *charcoal filter* **38** (col. 3, lines 40-44; and Fig. 1), or *other above*

ground treatment (col. 4, lines 19-24; and abstract). Thus, it would have been well within the skill of the artisan to have substituted the charcoal filter **38** of Calcote with other above ground treatment such as the port **58** of the mixing chamber **56** of Robson because this would have destroyed all of the contaminants rather than concentrate them on the filter. Robson teaches that the regeneration of activated carbon separates the contaminants from the carbon, but does not destroy all of the contaminants (col. 1, lines 36-56). It would have been desirable to one having ordinary skill in the art to have destroyed all of the contaminants.

As to wherein the light comprises wavelengths from 300 to 500 nm, Robson teaches that the light irradiated by the light irradiation means comprises a light whose wavelength is in the range of 300 to 500 nm (= UV light) [col. 3, lines 62-68].

As to wherein the pollutant is a halogenated aliphatic hydrocarbon; wherein the halogenated aliphatic hydrocarbon is an aliphatic hydrocarbon having at least one selected from the group consisting of chlorine substituent and fluorine substituent; and wherein the halogenated aliphatic hydrocarbon is at least one selected from the group consisting of trichloroethylene, 1,1,1-trichloroethane, tetrachloroethylene, cis-1,2-dichloroethylene, chloroform and dichloromethane, Calcote teaches that ground water is frequently contaminated by non-aqueous liquids such as organic solvents, including chlorinated hydrocarbons, e.g., trichloroethylene, 1,1,1-trichloroethane,

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trichlorofluoromethane, 1,2-dichloroethylene, perchloroethylene, trichloromethane, 1,1-dichloromethane and 1,1-dichloroethylene and petroleum products, including xylenes, toluene, benzene and gasoline. The contaminants form separate phases and are trapped in small crevices in the ground and within soil pores and are thus not easily displaced by water flow through the ground (col. 1, lines 14-33).

As to wherein chlorine concentration in the mixture is from 5 ppm to 1000 ppm; and wherein the chlorine concentration in the mixture is from 20 ppm to 500 ppm, the chlorine concentration is a result-effective variable and one skilled in the art has the skill to calculate the concentration that would determine the success of the desired reaction to occur, e.g., enough chlorine to decompose or oxidize the pollutant when irradiated with light, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Apparatus

II. Claims **28-35 and 37-39** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Calcote et al.** (US Patent No. 5, 813,799) in combination with **Robson** (US Patent No. 5,308,507).

Calcote teaches an apparatus for purifying polluted soil which contains a pollutant, comprising:

a gas-emitting means for heating **10, 12** for heating the polluted soil to make the soil emit a gas containing a pollutant **32** (col. 3, lines 20-44; and Fig. 1).

The heating is conducted using a heater **12** (col. 3, lines 20-44; and Fig. 1).

Calcote does not teach a chlorine-containing gas generating means for generating a gas containing chlorine, a mixing means for mixing the pollutant-containing gas and the chlorine-containing gas so as to form a gaseous mixture; and a light irradiation means for irradiating the gaseous mixture with light; and wherein the light irradiated by the light irradiation means comprises a light whose wavelength is in the range of 300 to 500 nm.

However, Robson teaches an apparatus for purifying polluted soil (col. 4, line 64 to col. 5, line 5) which contains a pollutant, comprising:

- (a) a chlorine-containing gas generating means (= electrolytic cell) **52** for generating a gas containing chlorine (col. 2, line 63 to col. 3, line 8; and Figs. 1 and 3);
- (b) a mixing means **56** for mixing a pollutant-containing gas and the chlorine-containing gas so as to form a gaseous mixture (col. 3, lines 37-46; and Fig. 4); and
- (c) a light irradiation means for irradiating the gaseous mixture with light (col. 3, lines 19-68).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the apparatus of Calcote with a chlorine-

containing gas generating means, a mixing means for mixing; and a light irradiation means for irradiating because Calcote teaches drawing the contaminant vapors **32** released by heating the aquifer and soil rise by a fan or vacuum pump **36** to a vapor condenser or *charcoal filter* **38** (col. 3, lines 40-44; and Fig. 1), or *other above ground treatment* (col. 4, lines 19-24; and abstract). Thus, it would have been well within the skill of the artisan to have substituted the charcoal filter **38** of Calcote with other above ground treatment such as the port **58** of a mixing chamber **56** of Robson because this would have destroyed all of the contaminants rather than concentrate them on the filter. Robson teaches that the regeneration of activated carbon separates the contaminants from the carbon, but does not destroy all of the contaminants (col. 1, lines 36-56). It would have been desirable to one having ordinary skill in the art to have destroyed all of the contaminants.

As to wherein the light irradiated by the light irradiation means comprises a light whose wavelength is in the range of 300 to 500 nm, Robson teaches that the light irradiated by the light irradiation means comprises a light whose wavelength is in the range of 300 to 500 nm (= UV light) [col. 3, lines 62-68].

Claim limitations directed to the polluted soil, pollutant, pollutant-containing gas, gas, functional water and chlorine concentration are not structural to the apparatus, and therefore, fails to distinguish the apparatus from the prior art.

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Claim limitations directed to forming a gaseous mixture, passing a gas through functional water, heating is conducted by mixing and producing the functional water by electrolysis are method limitations and are not structural to the apparatus. Therefore, these limitations fail to distinguish the apparatus from the prior art.

Furthermore, as to the chlorine-containing gas generating means, apparatus claims cover what the device is, not what a device does. An apparatus claim may be obvious even if it operates in the same way as the prior art, as long as there are structural differences. *Hewlett-Packard Co. v. Bausch & Lomb Inc.* 15 USPQ 2d 1525 (Fed. Cir. 1990); *Demco Corp v. F. Von Langsdorf Licensing Ltd.* 7 USPQ 2d 1222, 1224-1225 (Fed. Cir. 1988).

It is deemed that the electrolysis cell **52** of Robson is *structurally* capable of electrolytically producing a gas containing chlorine. Robson teaches an electrolytic cell **10** comprising an anode **12** and a cathode **14** which are separated by an insulating gasket **16** thereby forming a flow chamber **24** which a salt solution is passed (col. 2, line 63 to col. 3, line 8; and Figs. 1 and 3). Passing an aqueous solution containing hypochlorous acid in the electrolysis cell of Robson would have generated a gas containing chlorine, unless proven otherwise.

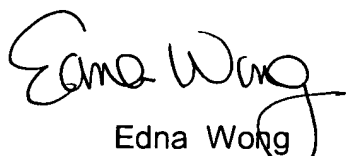
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-

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3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.



Edna Wong
Primary Examiner
Art Unit 1753

EW
October 16, 2003